

## REMARKS

Claims 15, 17, 18, 24, and 25 are pending and have been rejected under 35 U.S.C. §103. Claims 1-14, 16, 19-23, and 26-29 have been cancelled in previous correspondence. Claims 15 and 25 are amended herein. Support for the amendment to these claims is found in at least paragraph 9 and in the table of the specification. Claims 30 and 31 are newly added. Claims 15, 17, 18, 24, 25, 30, and 31 remain for consideration upon entry of the present Amendment. No new matter has been added.

Claims 15, 17, 18, 24, and 25 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,609,524 to Ferrari (hereinafter “Ferrari ‘524”) in view of U.S. Patent No. 3,677,894 to Ferrari (hereinafter “Ferrari ‘894”) in combination with either U.S. Patent No. 5,437,747 to Adamson et al. (hereinafter “Adamson”) or U.S. Patent No. 5,329,566 to King (hereinafter “King”). The reasons for this rejection are the same as those stated in Section 7 of the Office Action dated April 21, 2008.

Claims 15 and 25 of the present application have been amended as indicated above.

Ferrari ‘524 fails to disclose, teach, or suggest a nuclear fuel rod for a boiling water nuclear reactor comprising a cladding tube, defining a closed inner space and which is manufactured from at least one of the materials in the group zirconium and a zirconium-based alloy, the material of the cladding tube comprising a plurality of sites in which hydrogen is capable of being adsorbed, as recited in amended claim 15 and in amended claim 25. Ferrari ‘524 also fails to disclose, teach, or suggest a nuclear fuel rod for a boiling water nuclear reactor in which the carbon monoxide is located in the sites in which hydrogen is capable of being adsorbed, thereby blocking the sites, as recited in amended claim 15 and in amended claim 25. Applicants respectfully assert that the material of the cladding tube comprising sites in which hydrogen is capable of being adsorbed and carbon monoxide located therein are not process limitations because both limitations positively recite sites and carbon monoxide located therein as structure. Any adsorption of hydrogen (or “hydrogen capable of being adsorbed”) is not part of the claimed invention because of the carbon monoxide in the sites of the cladding tube. More specifically, the nuclear fuel rod of claim 15

and the nuclear fuel assembly of claim 25 are both structurally intact when the material of the cladding tube includes sites containing carbon monoxide whether or not hydrogen is present. Therefore, Applicants respectfully assert that claims 15 and 25 do not include process limitations (as the Examiner alleges). Furthermore, because claims 15 and 25 recite a plurality of sites in which carbon monoxide can be located whereas Ferrari '524 is more directed to oxide coatings, the fuel rods and fuel assemblies as recited in claims 15 and 25 are different and therefore do not inherently function in the same manner.

Furthermore, Ferrari '524 fails to disclose, teach, or suggest a nuclear fuel rod for a boiling water nuclear reactor in which the internal pressure ( $P_{\text{fill}}$ ) of the fill gas in the nuclear fuel rod amounts to at least about 7 bar (abs) at room temperature ( $T_R$ ) and the proportion of carbon monoxide is at least 4.7 volume percent of the initial gas, as recited in claims 15 and 25. Ferrari '524 discloses a carbon monoxide addition of only 2-3 percent by volume to the initial fill gas. A nuclear fuel rod in which the proportion of carbon monoxide is at least 4.7 volume percent, as in claim 15, or a nuclear fuel assembly comprising such fuel rods, as in claim 25, is not one in which the carbon monoxide is only 2-3 percent by volume, as in Ferrari '524. There is no overlap of the ranges. With regard to the internal pressure, Ferrari '524 makes no mention of the initial gas having a specific internal pressure. Therefore, the internal pressure of the fill gas being at least about 7 bar further distinguishes the nuclear fuel rod of claim 15 and the nuclear fuel assembly of fuel rods of claim 25 from Ferrari '524.

Ferrari '894 fails to disclose anything related to a fuel rod or fuel assembly for a boiling water reactor. In contrast, Ferrari '894 is directed to a pressure water reactor, which is not a boiling water reactor and which operates differently from a boiling water reactor. Accordingly, Applicants respectfully assert that Ferrari '894 is not properly combinable with the primary Ferrari '524 reference.

The Examiner indicates that the primary (Ferrari '524) and secondary (Ferrari '894) references teach that it is necessary to determine an optimum proportion of carbon monoxide in the fill gas such that the advantages are maximized. The Examiner also indicates that Adamson and King are relied on to teach the disadvantages of having carbon monoxide. The Examiner alleges that Applicants' arguments against Adamson and King are misplaced because it has not been shown

that these references do not teach what the Examiner has stated that they teach nor that the Examiner's reasoning is improper or invalid.

Irrespective of what the two Ferrari references teach, Applicants respectfully submit that the fact that Adamson and King teach disadvantages by the addition of carbon monoxide to the fill gas is reason enough for their not being combinable with the Ferrari references. In particular, a skilled person would not have used Adamson or King to search for advantages by the addition of carbon monoxide to the fill gas. Even if a skilled person had looked to Adamson or King, that person would not have expected an advantage by the addition of carbon monoxide. Accordingly, the addition of carbon monoxide would have caused an unexpected effect. Such an unexpected effect in view of prior art would be evidence of non-obviousness. Accordingly, Applicants respectfully submit that the combination of the Ferrari references with either or both of Adamson and King is not applicable to render the nuclear fuel rod of claim 15 and the nuclear fuel assembly of claim 25 obvious.

Moreover, since the Ferrari references are directed to advantages of the addition of carbon monoxide, and since Adamson and King are directed to disadvantages of the addition of carbon monoxide, Adamson and King effectively teach away from the Ferrari references. Because these references teach away from each other, either or both of the Ferrari references are not properly combinable with either Adamson or King.

Because none of Ferrari '524, Ferrari '894, Adamson, and King individually disclose, teach, or suggest the nuclear fuel rod of claim 15 or the nuclear fuel assembly of claim 25, none of these references in any combination would disclose, teach, or suggest such a nuclear fuel rod or nuclear fuel assembly. Therefore, less than all the claim limitations are taught by the cited references individually and in combination. Consequently, because less than all of the claim recitations are taught by the cited references, Applicants' amended claims 15 and 25 are necessarily non-obvious, and Applicants respectfully request that the Examiner withdraw the rejections of claims 15 and 25.

Claims that depend from a claim that is non-obvious are themselves necessarily non-obvious. Because claims 17, 18, and 24 depend from claim 15, and because claim 15 is asserted to be non-obvious for the reasons presented above, claims 17, 18, and 24 are necessarily non-obvious. Applicants, therefore, respectfully

submit that claims 17, 18, and 24 are allowable. Accordingly, Applicants respectfully request that the rejections of claims 17, 18, and 24 be withdrawn.

Furthermore, the nuclear fuel rod of the newly added claim 30 and the nuclear fuel assembly of claim 31 likewise are not disclosed or suggested by the above cited references for at least the same reasons as those cited above.

Applicants believe that the foregoing amendments and remarks are fully responsive to the Office Action and that the claims herein are allowable. An early action to that effect is earnestly solicited.

If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

Applicants believe that no fees are due with the submission of this Amendment. If any charges are incurred with respect to this Amendment, they may be charged to Deposit Account No. 503342 maintained by Applicants' attorneys.

Respectfully submitted,

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